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The compatibility effects of irradiated recycled PP on the mechanical and water properties of recycled PP/microcrystalline cellulose composites (Conference Paper)

Samat, N., Yahya, M.S., Lazim, N.H.M.

Department of Manufacturing and Materials, Kuliyyah of Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, Gombak, Selangor DE, Malaysia

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Abstract

Polypropylene (**PP**) is a thermoplastic that is used in many applications. Hence, the recycling of **PP** is very important for the sustainability of the environment. However, the **properties** of **recycled PP** (rPP) are lower compared to virgin polypropylene due to the rupturing of its structure during the recycling process. One of the techniques that can be used to modify the polymer structures is electron radiation. This study was aimed at investigating the **compatibility** of **irradiated** rPP in rPP **composites** reinforced with **microcrystalline cellulose** (MCC). The rPP/MCC **composites** were prepared according to the ratio of 70/30 wt% (unirradiated/**irradiated**) rPP, before the addition of various compositions of MCC at 5, 20 and 40 wt%. The rPP resin pellets were **irradiated** with 5, 20 and 50 kGy before the compounding process. **Mechanical** and **water** resistance tests were conducted to evaluate the **compatibility** of the **composites**. The results showed that the **mechanical properties** were improved at a certain electron radiation dosage and MCC loading. Although the **water** resistance deteriorated at higher MCC loadings, the radiation dosage did not influence this property. © 2016 Author(s).

Author keywords

cellulose; irradiation; **mechanical**; polypropylene; **water** uptake

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Izzati Zulkifli, N., Samat, N., Anuar, H., Zainuddin, N.